Crystallization Lab Research and Background

**Background Information:** *Most solids are made of crystals. A* ***crystal*** *is a regular, repeating arrangement of atoms. The simplest crystal conceptually is the simple cubic structure, where the atoms lie on a grid: layers of rows and columns. When you look at a pure crystal you are seeing how the atoms are arranged at the molecular level. Because this pattern keeps repeating itself it becomes large enough for you to “see” the arrangement of the atoms. Scientists grow crystals of various compounds so that they can see how the atoms are arranged. One method of growing crystals is called* ***recrystallization.*** *This is a process that is used to purify solid material by dissolving the solid (called a* ***solute****) in an appropriate liquid (called a* ***solvent****) and then having the material come out of a saturated solution in crystalline form. As the solvent evaporates the solid crystals begin to grow larger. Depending upon conditions, one may obtain a mass of many small crystals or one large crystal.*

**Objective:** Observe the arrangement of atoms in 4 compounds: Alum (AlKSO4), Borax (Sodium Borate (Na2B4O7)), Copper Sulfate (CuSO4) and Table Salt (Sodium Chloride (NaCl)) by identifying the crystal shape that grows after completion of the recrystallization process.

Research:

Learn about the various arrangements of atoms. Make sure to understand how you would classify the compounds.

Write a description and a draw a picture for each of the following types of arrangements: cubic, hexagonal, orthorhombic, triclinic, monoclinic, and tetragonal

1. Cubic
2. Hexagonal
3. Orthorhombic
4. Triclinic
5. Monoclinic
6. Tetragonal